## Comparison of Sense of Sustainability and Premium Components in Japan: A Study using the Evaluation Grid Method

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#### **1 INTRODUCTION**

Sustainability is not only a social issue, but also an issue for each individual consumer, because consumers are part of the supply chain of various goods and services. Therefore, understanding how consumers perceive and adopt sustainability is important in promoting sustainability.

Previous studies have reported a discrepancy between what is actually sustainable and what is subjectively perceived as sustainable. Steenis et al. showed that consumers do not consider products in paper boxes that are actually sustainable to be sustainable and that they consider glass bottles that are not actually sustainable to be sustainable [1]. In this study, subjective sustainability is called "sense of sustainability" and is distinguished from objective sustainability. To investigate how people perceive sustainability, it is necessary to consider the sense of sustainability in goods and services.

Sustainability is considered a new value in goods and services. However, consumers have values that have been emphasized in the past. When various values are attached to a service or a product, it is difficult to satisfy them simultaneously if the increase of one of them decreases the other. As consumers adopt the value of sustainability, the relationship with traditional values will be important.

One value that has been emphasized and considered is sense of premium [2]. Kapferer and Michaut suggest that sustainability may be one of the quality factors expected by customers of luxury (a concept similar to premium) goods [3], while Kunz et al. point out that sustainability and luxury are perceived as conflicting concepts [4]. Therefore, it is not clear what kind of relationship exists between the sense of sustainability and the sense of premium.

The purpose of this study is to determine the sense of sustainability, including its relationship to the sense of premium. To this end, we will visualize the components of the sense of sustainability and the sense of premium using the evaluation grid method. To compare the components of the sense of sustainability and the sense of premium, it is necessary to organize them according to a common classification. Sustainable development has three innovative components: environmental protection (I), social inclusion (II), and economic growth (III) (Fig. 1) [5]. Given the possibility that customers of luxury goods expect sustainability [3], the senses of sustainability and premium are organized along these three components in this study.

#### 2 MATERIALS AND METHODS

#### 2.1 Evaluation grid method

This study conducts interviews based on the evaluation grid method, which can visualize the evaluation structure hierarchically [6,7]. The original evaluation grid method is a face-to-face interview, but this study is based on that procedure



Fig.1 Three innovative elements of sustainable development

and is conducted in the form of an online questionnaire using a Web User Interface.

In the evaluation grid method, for example, participants compare what they consider to be a high sense of sustainability and what they consider to be a low sense of sustainability and describe the reasons, conditions, and their connections in a hierarchical manner. A hierarchical evaluation structure grid can be created with abstract value judgments at the top, sensory understanding in the middle, and objective and concrete understanding at the bottom (Fig. 2).

The results of the evaluation grid are compiled into an evaluation structure diagram using the Evaluation Structure Visualization (ESV) system developed by the Kansei Value Creation Institute of Kwansei Gakuin University, to which the authors belong. ESV is capable of setting threshold values (Katz centrality) based on the frequency of occurrence and the values of components that are strongly related to other components and can be used to create a graphical representation of components that are wellconnected to other components.



Fig.2 Explanation of evaluation structure

#### 2.2 Targeted goods and services

To examine various goods and services, we targeted 19 industries, excluding "unclassifiable industries" from the major items of the Japanese Standard Industrial Classification (Table 1) [8].

Table 1 19 industries targeted in this study

No.	Industries
1	Agriculture, Forestry
2	Fishing (Industry)
3	Mining, Quarrying, Gravel Extraction
4	Construction Industry
5	Manufacturing Industry
6	Electricity, Gas, Heat Supply, and Water Supply
7	Information and Communication Industry
8	Transportation Service, Postal Service
9	Wholesale Trade, Retail Trade
10	Finance, Insurance
11	Real Estate Business, Goods Rental Business
12	Academic Research, Professional and Technical Services
13	Lodging Services, Food Services
14	Lifestyle-Related Services, Entertainment
15	Education, Learning Support Industry
16	Medical Care, Welfare
17	Compound Service Business
18	Services (Not Elsewhere Classified)
19	Public Business

# 2.3 Measurement of objective sustainability knowledge and attitude

To examine the participants' objective knowledge and attitudes toward sustainability, we administered a sustainability knowledge task consisting of a 10-item correct/incorrect judgment task, developed based on the Ministry of the Environment's "Domestic and International Situation Surrounding Plastic" [9], and a 31-item sustainability attitude questionnaire (Japanese translation) by Haan et al. The questionnaire consists of 31 items, including 5 factors of sustainability spending, skepticism (-), responsibility, support, and mobility [10].

## 2.4 Detecting dishonest participants and confirming the tendency of compliance with instructions

The implementation of the evaluation grid method using the Web UI may include inappropriate answers by dishonest participants. To detect this, we added a satisficer detection item to the Personality Scale (TIPI-J) [11]: "Please select approximately disagree with this question." Participants who made a choice other than the one indicated were suspected to be a satisficer who ignored the instructions and answered inaccurately [12]. Therefore, the participant's data could be omitted from the analysis. In addition, a group of participants who tend to comply with the instructions have moderate correlations between each of the two items measuring the five factors of the TIPI-J: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience [13]. This method is also used for a posteriori validation.

## 2.5 Survey Methodology

#### 2.5.1 Participants

Participants were recruited through a Japanese crowd-working service. A total of 380 participants, 20 per industry, answered all questions, excluding those who dropped out during the survey.

The total number of participants was 128, consisting of 63 males and 65 females (mean age 41.8 years, SD = 9.6; 39.1 years, SD = 9.5; respectively). The number of industries per participants ranged from 1 to 19.

2.5.2 Period

The survey was conducted November 11-16, 2022.

2.5.3 Questionnaires and Procedures

All questions were asked in the form of a Web-based questionnaire. Participants were asked if they felt the industry had a high level of sustainability or premium, and if they felt the current level of sustainability was high compared to the ideal for the industry. Next, participants were asked to recall as many goods and services as possible that have a high/low sense of sustainability/premium for the industry. After explaining the evaluation grid method using a Web UI form (web survey form interface is formatted and displayed according to the hierarchical structure of the evaluation grid using HTML and CSS.), they were asked to enter their answers. Finally, a sustainability knowledge task and an attitude questionnaire were conducted.

## **3 RESULTS**

#### 3.1 Tendency of participants' compliance with answers

No participants answered incorrectly on the satisficer detection question, and each of the two items measuring the five factors of the TIPI-J showed more than moderate correlations (extraversion: -.51, agreeableness: -.39, conscientiousness: -.65, emotional stability: -.60, and openness to experience: -.57, all significant at the 1% level). Based on these results, the participants were considered to have complied with the instructions to answer the questions, and thus, the subsequent analysis was conducted.

#### 3.2 Participants' Sustainability Knowledge and Attitudes

The results of the sustainability knowledge task showed that the average correct answer rate was 77% (SD = 0.80).

Subscale scores were calculated for each of the five factors for responses to the Sustainability Attitude Questionnaire (Fig. 3).



Fig. 3 Sustainability attitude score

Since actual sustainability costs a little extra, it is assumed that the degree to which one can tolerate the cost will affect one's sense of sustainability. Therefore, the correlation coefficients between the "spending on sustainability" factor and the other four factors were calculated from the scores of the five sustainability attitude factors (Table 2). The correlation coefficients between the spending on the sustainability factor and the other four factors are moderate.

Table 2 Correlation between sustainable spending and the other four factors

	Skepticism(-)	Responsibility	Support	Mobility
Spending	.48	.58	.42***	.34
				**: <i>p</i> < .01

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Fig. 4 Evaluation grids of sense of sustainability (Katz centrality = 0.045)

## 3.3 Results of the evaluation grid method

At the end, 4,849 responses (components) were obtained. Responses with similar content were categorized and grouped together. Of all the responses, 2,900 were grouped into 497 categories, and those corresponding to environmental protection (I), social inclusion (II), and economic growth (III) were classified using color coding. The categories that could be classified into more than one category were not classified and left as they were.

The evaluation grids of sense of sustainability are shown in Fig. 4. The components of a grid describing a high sense of sustainability showed that resource conservation, reusability, waste reduction, cost reduction, and environmental considerations, such as recycling and protecting nature, increased the sense of sustainability. The components of a grid describing a low sense of sustainability showed that greenhouse gas emissions are bad for the environment, produces garbage, and high cost decreased the sense of sustainability.

The evaluation grids of sense of premium are shown in Fig. 5. The components of a grid describing a high sense of premium showed that high prices and fees, rarity, specialness, satisfaction, good quality, added value, and high cost increase the sense of premium. The components of a grid describing a low sense of premium showed that the not using good quality products, mass production, conveniently available to everyone, and low cost decreased the sense of premium.

#### 4 DISCUSSION

In this study, the evaluation grid method was used to determine the evaluation structure of consumers' senses of sustainability and premium. Participants' current sustainability knowledge and attitudes were also examined.

In the evaluation structures of high and low senses of sustainability, most of the factors are related to environmental protection (I), and none of the factors related to social inclusion (II) are shown. A few components related to economic growth (III) were found to be related to cost: "cost reduction (high sense of sustainability)" and "high cost (low sense of sustainability)". These results indicate that most of the factors that influence the sense of sustainability are related to environmental protection (I), and are perceived as being biased against subjective sustainability, which includes social inclusion (II) and economic growth (III).

In the evaluation structures of high and low senses of premium, most of the elements are related to economic growth (III), and the elements of "high cost (high sense of premium)" and "low cost (low sense of premium)" were also found. Factors related to environmental protection (I) and social inclusion (II) were not indicated.

A common cost component was shown to be associated with both the sense of sustainability and the sense of premium. The cost component of the sense of sustainability is related to waste reduction and reusability (high sense of sustainability) and to the produces garbage (low sense of sustainability). On the other hand, the components related to the cost of the sense of premium are connected to the high price and cost, the demand via good quality (high sense of premium), the not using good quality products, and conveniently available to everyone (low sense of premium). That is, the sense of sustainability and the sense of premium have a common component of cost, but the cost of the sense of sustainability is composed of subcomponents related to environmental protection (I), whereas the cost of the sense of



Fig. 5 Evaluation grids of sense of premium (Katz centrality = 0.045)

premium is composed of subcomponents related to economic growth (III). Therefore, although there appears to be a trade-off relationship between the two, as low cost is associated with a high sense of sustainability and low sense of premium, no common component behind the two indicates that they are independent of each other. The results of this study are not in consistent with previous studies indicating that sustainability is a conflicting concept of premium or a component of the sense of premium [3,4]. The cost component of the sense of sustainability and the sense of premium can be considered qualitatively independent of each other, unless there is a reason for the difference in the two components.

Based on the scores of the sustainability knowledge task, it can be said that the participants in this study have some objective knowledge of sustainability. The scores for attitude were not high for any of the factors. The fact that the scores for spending on sustainability were not high suggests that the participants do not accept that sustainability is costly. However, the more responsible, non-skeptical, and cooperative one is toward sustainability, the more acceptable spending sustainably tends to be. This suggests that the higher the level of people's attitudes toward sustainability, the more likely they are to accept the cost of sustainability in the future. It is important for people to have a deeper understanding of sustainability and to recognize that they are correctly spending money on sustainability.

## 5 CONCLUSION

This study visualized the evaluation structure of how consumers understand the senses of sustainability and premium using the evaluation grid method. Most of the factors that influence a high or low sense of sustainability are related to environmental protection (I) and are understood subjectively rather than through objective sustainability. On the other hand, most of the factors that influence the high or low sense of premium are related to economic growth (III), and no factors related to environmental protection (I) were indicated. In addition, the sense of sustainability and the sense of premium were influenced in opposite directions by a common component, cost, but there was no common component behind them. These results suggest that the sense of sustainability and the sense of premium are independent of each other.

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